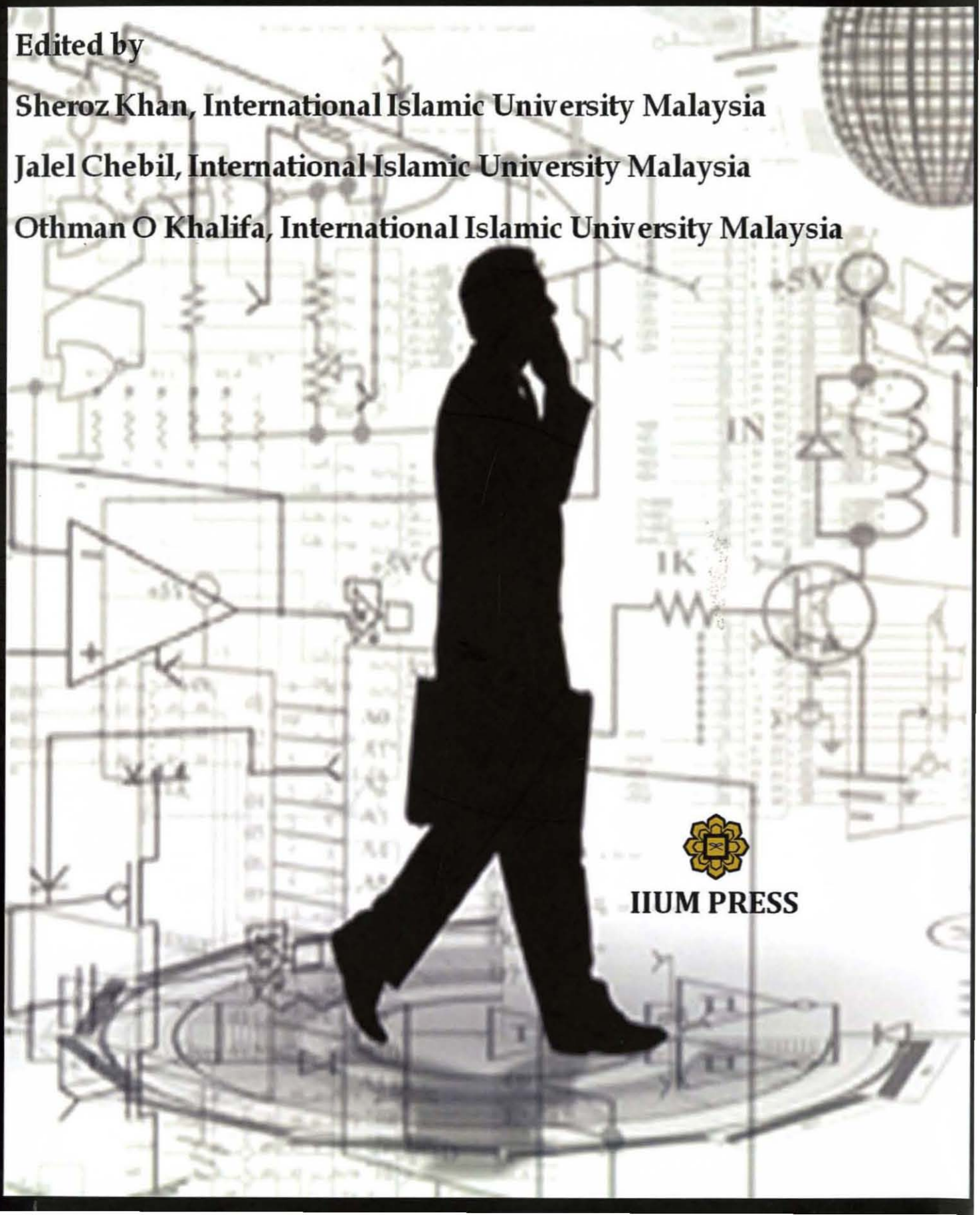
PRINCIPLES OF TRANSDUCER DEVICES AND COMPONENTS

Edited by

Sheroz Khan, International Islamic University Malaysia

Jalel Chebil, International Islamic University Malaysia

Othman O Khalifa, International Islamic University Malaysia



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Selangor Darul Ehsan
Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543
EMAIL: iiumprinting@yahoo.com

CONTENTS

Chapter 5

SENSORS IN ELECTRONIC APPLICATIONS

RUMANA TASNIM, ATIKA ARSHAD, SHEROZ KHAN, MUSSE MOHAMOD

5.0 INTRODUCTION

In response to any change in the measuring quantity (stimulus), input type transducers or sensors generate a proportional output voltage or signal which basically depends on the sensor type in use. Usually sensors are categorized into two types: active and passive sensors. There are also some other type of sensors such as; digital sensors, deflection sensors and null sensors. In this chapter only active and passive sensors will be discussed in depth. Based on the sensors' working mechanism the classification of sensors can be done. Resistive sensors include temperature sensors, strain gauges, photoresistors, relative humidity sensors, position/angle sensors, GMR sensors etc. Several voltage generating sensors are quite in use that includes thermocouples and thermopiles, photovoltaic cells, piezoelectric transducers, pyroelectric sensors, magnetic field voltage generating sensors, hall sensors etc, which are quite recognizable. Other working mechanism offers a number of sensors like variable magnetic coupling sensors, variable capacitance sensors, fiber optic sensors, magneto-optic sensors, photomultipliers etc.

5.1 SENSORS' SIGNAL CLASSIFICATION

Based on the complexity of a control system, the application of sensors is determined [1]. A sensor is normally designed considering the correlations between the application of basic laws of physics and the quantity of interest to measurement parameters and events. Some examples of sensors and their sensing principle are presented in Table 5.1.